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ABSTRACT

Cognitive dissonance theory assumptions were used in a formal program of attitude change. The objective was first to improve subject attitudes toward an instructional activity, then subject achievement in this instructional activity was measured to determine if achievement was influenced by subject attitudes toward instruction. Two hundred eighteen college students were randomly assigned to one of three treatment groups. Analysis of variance tests were used to evaluate experimental hypotheses. Results demonstrated that it was possible to improve, experimentally, subjects' attitudes toward the instructional activity in the short term and the long term by a camouflaged treatment requiring subjects to commit themselves on videotape. Achievement differences were not significant, but trends of scores supported the experimental hypotheses. (Author/CH)

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TITLE: VIDEOTAPED COMMITMENT: INFLUENCE ON SUBSEQUENT STUDENT ATTITUDE AND ACHIEVEMENT

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ATTITUDE CHANGE AND ACHIEVEMENT: DISSONANCE THEORY IN EDUCATION

-- ABSTRACT --

Cognitive dissonance theory assumptions were used in a formal program of attitude change in order to improve S attitude toward an instructional activity. S achievement in this instructional activity was then measured to determine if achievement was influenced by S attitude toward instruction. Two hundred eighteen (218) Ss were randomly assigned to one of three treatment groups. Analysis of variance tests were used to evaluate experimental hypotheses and an .05 level of significance was selected. Results demonstrated that it was possible to experimentally improve S's attitudes toward the instructional activity in the short term ($p < .0001$), and in the long term ($p < .009$), by a camoflaged treatment requiring Ss to commit themselves on videotape. Achievement differences were not significant, but trends of scores supported hypotheses.

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VIDEOTAPED COMMITMENT: INFLUENCE ON SUBSEQUENT STUDENT ATTITUDE AND ACHIEVEMENT

Videotaping is a relatively established procedure for use in instructional situations. However, the use of videotape as a powerful tool for an attitude change treatment requiring active student involvement rather than passive student observation is not a typically used instructional technique.

Student attitude toward course content is an important educational concern. Attitude has been identified as an indicator of student achievement. The more favorable a student's attitude toward a course, the more likely that student is to achieve highly (6, 18, 19, 21). Researchers have used attitude toward course content as one of several variables in regression formulas that have been used to consistently predict student achievement (2, 7).

Greenwald (13, 14) went one step further, and attempted to influence student behavior (the number of story problems completed) merely by attempting to change student attitudes (need for story problems). Greenwald used a well designed treatment to change attitudes. Results reported that student attitudes were changed and student behavior seemed to be significantly influenced by this change. Unfortunately, other researchers have not been able to confirm this relationship (12, 16).

This experimental study was designed, first to determine if student attitude toward the content of an instructional activity could be experimentally improved, and second to observe any resulting changes in student

achievement after attitude change had occurred.

Dissonance Theory

Festinger (9) has developed a working theory for changing attitudes. In describing his theory of cognitive dissonance, Festinger stated that if a person had two cognitions that were inconsistent with one another the individual would experience a state of unsettledness--cognitive dissonance. Dissonance could be reduced by altering one of the conflicting cognitions--normally the one that was least powerful. This theory has been validated as a method for attitude change in experimental situations (1, 11).

The lack of conclusive evidence supporting the persistence of changed attitudes has been cited as a flaw in the dissonance theory framework (12, 15, 22). Also criticized has been the scarcity of studies that attempted to relate the impact of attitude change on subsequent behaviors (3, 10).

A corollary to Festinger's theory has been proposed by commitment researchers. It has been found that commitment to stated cognitions tends to reinforce and more tightly structure these cognitions. Thus, even if dissonance is not produced the act of commitment to previously stated attitudes tends to make the attitude position even more extreme (17, 20).

THE PROBLEM

Three sets of predictions were made in this experiment. It was predicted that experimental subjects (Ss) who had expressed negative attitudes toward a specific instructional activity on an attitude measure, and who participated in a dissonance treatment, would improve in their attitude toward the instructional activity, and that these dissonance produced more positive attitudes would persist for two months. Second, it was predicted that Ss who had expressed positive attitudes toward an instructional activity on an attitude measure, and who committed themselves to these attitudes, would report more extremely positive attitudes toward the activity, and that these improved attitudes would persist for two months. Finally, it was predicted that Ss who experienced a dissonance treatment designed to improve their attitudes toward an instructional activity would be high achievers in the activity, as compared to Ss with untreated attitudes.

METHOD

Ss

Two hundred and eighteen college juniors and seniors (159 female and 59 male) who were enrolled in one of fourteen sections of a teacher education course in media methods participated in the study. Seventeen

Ss started the study but did not finish because they dropped the course and data could not be obtained for them. There was no discernable trend for dropped Ss. Two other Ss were dropped from the study for reasons stated below.

Measures

Two measures were developed for this study--one to measure attitude toward the content of the instructional activity, and one to measure achievement in that activity. The Media Education Attitude Scale (MEAS) was a five item, likert-type attitude measure. MEAS had a reliability estimate of .82(r=.82; in 8). MEAS was administered to each S a week before, and again just after, treatment procedures. These measures were identified as $MEAS_1$ and $MEAS_2$. The index of short term attitude change (a dependent variable) was obtained by subtracting the $MEAS_1$ score from the $MEAS_2$ score. This variable was identified as $MEAS_{2-1}$. MEAS was readministered to Ss two months after the treatment. This attitude score ($MEAS_3$) was used with $MEAS_1$ to obtain an index of long term attitude change (a dependent variable). This variable was labeled $MEAS_{3-1}$.

A seventy-item, five response test of the cognitive content of the instructional activity was developed and called the Media Achievement Test (MAT). Items for MAT were developed by a team of practicing media

specialists. Questions were based on the specific instructional objectives used to teach the course. Content reflected the group's estimate of what was relevant information about media and education. MAT had a KR-20 reliability estimate of .87(r=.87; in 8). MAT was administered twice to each S--once on the first day of class (MAT_1), and again on the last day (MAT_2). The dependent variable used to test achievement predictions was obtained by subtracting MAT_1 from MAT_2, and was labeled MAT_{2-1}.

Analysis of variance and Scheffé tests were used to obtain p values. An .05 level of significance was selected.

Procedures

Ss were randomly assigned to one of three treatment groups using a table of random digits. During the first class period all Ss were tested using MEAS and MAT. In addition to providing a baseline for attitude change estimates, $MEAS_1$ was used to place Ss in the appropriate level of their treatment group. Ss with $MEAS_1$ scores below the median of scores were assigned to the dissonance level. Ss with scores above the median were assigned to the commitment level. Also, during the first class meeting Ss were asked to sign up for mandatory participation in an "Instructional Improvement Needs Assessment".

The "Instructional Improvement Needs Assessment"

was a fictitious title selected for treatment procedures. During the treatment each S was individually met by the experimenter (E) in a special room. The S was told by the E that:

> "I am a member of a committee in the College of Education called the Instructional Improvement Needs Assessment Committee. We are attempting to obtain as much information as possible about student opinions of college courses. This is a difficult thing to do so we are asking for several different types of information."

Then, depending on the random treatment group assignment, the E told the S:

1. Control Group:

> "I would like you to complete this Needs Assessment opinionnaire (including MEAS items mixed with other unrelated items). You can complete it in the next room. Answer on the IBM score sheet and when you are done place the opinionnaire and answer sheet in the box."

2. Irrelevant Group:

> "The entire committee would like to study student opinions so I will give you several minutes to think of everything positive you can about (<u>some experimentally irrelevant college course</u>). Then I will take you into the next room where we would like to have you state those positive comments

while you are being videotaped. We need to videotape you so that the entire committee can get together and observe all the videotapes made by students. That way we can begin to identify similar comments on what students feel is beneficial about college courses. I'll give you five minutes to collect your thoughts. Organizing your ideas into a type of essay is not necessary, but that might be nice."

The S was then given time to jot down ideas about the selected course. When the S was ready, the E took the S to the video studio, had the S stand behind the podium, and read or speak his comments while being videotaped. The S could see the video recorder reels rotating, but could not see the television monitor. At the conclusion of the taping the S was asked to sign a release form because:

"Faculty and students will be viewing this tape."

Then the S returned to the E's office and was asked to complete the same opinionnaire (including MEAS) that control Ss also completed.

3. Relevant Groups: The same procedures followed by the irrelevant group were followed by this group of Ss, except the instructional activity discussed on the videotape was specified as the experimentally relevant teacher education course they were enrolled in. All other treatment procedures were identical.

In order to ensure that a standard treatment procedure was carried out for all Ss the E either read or recited comments from 5 x 8 cards. The same E tested all Ss. Only two Ss questioned the fictitious needs assessment cover story. One in each of the relevant and irrelevant videotape groups, and both because they did not want to be videotaped. Data from both Ss were not used in the study. Other Ss were more or less happy to be of assistance in a program of instructional improvement.

Attitude Change Treatments

Ss with pre-course attitudes ($MEAS_1$) that were below the median of all attitudes and who were randomly assigned to the relevant videotape group were expected to experience dissonance when they stated positive comments about the educational methods course (9). This dissonance producing experience was heightened by having experimental Ss believe that a group of peers and faculty would be viewing their comments. The videotaping session, and the signing of the release form, were included to make the treatment procedures seem as forceful and irreversable as possible. It was hypothesized that a S's dissonance would be reduced most easily by changing his attitude toward the course.

Ss with attitudes that were above the median before the treatment ($MEAS_1$), and who were assigned to the relevant treatment, were also asked to make a

videotape. Their public commitment to a previously measured positive attitude was hypothesized as likely to produce a more tightly structured set of cognitions about the relevant course (20). The act of planning the comments to be videotaped and the actual videotaping was included to cause commitment Ss to become even more positive in reporting their attitudes toward the course.

Two control groups were used, one to control for the possible impact of videotaping, and the second for change due to extraneous events.

RESULTS

Descriptive Statistics and Analysis of Variance (ANOVA) results for the three dependent variables are found in Tables 1-3. Short term attitude change predictions were supported for both the dissonance and commitment levels (above and below median). Scheffé test results revealed that the experimental Ss who made either a dissonance producing or commitment videotape about the instructional activity relevant to this study improved significantly in attitude, as indicated by the dependent variable $MEAS_{2-1}$ ($p < .05$; Table 1).

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Insert Table 1 about here

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These experimentally improved attitudes remained significantly improved for two months in the commitment level ($p < .05$; Table 2), supporting the long term prediction for commitment produced attitude change. The dissonance level group did maintain a more positive attitude toward the instructional activity than controls, but the required significance level was not reached ($p < .12$; Table 2).

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Insert Table 2 about here

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Achievement predictions were not statistically supported. However, the trend of scores did substantiate predictions in the dissonance (below median) level (Table 3). A post-hoc analysis was computed, and it

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Insert Table 3 about here

- -

was found that control groups with above median pre-course attitudes ($MEAS_1$) achieved significantly better than control Ss with pre-course attitudes that were in the below the median level ($t_{abv,blw}=2.33$, $p < .02$).

ANOVA tests for short and long term attitude change

indicated an unpredicted significant difference between the above and below median attitude levels. This significant result was attributed to a regression to the mean effect resulting from the use of change scores as dependent variables ($MEAS_{2-1}$, and $MEAS_{3-1}$).

Sex Differences

There was no significant sex difference found for any dependent variable (5).

DISCUSSION

Positive student attitude toward the content of an instructional activity should be an important goal of the teacher. In this study it was found that Ss with negative attitudes toward the content of a teacher education course in media methods significantly improved in attitude after treatment procedures. Cognitive dissonance theory (9) assumptions were used to provide a theoretical framework for an experimental treatment where Ss were asked to make a short videotape indicating what they considered to be positive professional consequences of the specific instructional activity studied in this experiment. This videotape was to be used by a college committee (fictitious) studying ways to improve college teaching and college courses. Comments made on the tape were dissonant to a previously measured attitude. This overt activity

(videotaping) was hypothesized as being likely to produce cognitive dissonance within the S. Reduction of this dissonance was most easily accomplished by changing the attitude toward the course, because this attitude was not as firmly anchored in reality as the videotaped comments. Results supported this hypothesis.

Ss with an attitude toward the course content that was above the median of attitude scores, and who committed themselves on videotape to this positive attitude changed significantly in attitude toward the course in a positive direction. It was hypothesized that this change was due to a cognitive restructuring of internal information relating to the attitude, so that these cognitions were even more tightly grouped, and because of this restructuring the S would be likely to report a more extreme attitude on subsequent measures. This hypothesis was supported.

When Ss were compared in multiple analysis of variance tests it was found that the attitude scores of Ss with experimentally improved attitudes remained significantly higher than control's attitude scores, even after two months had elapsed. However, close study of descriptive statistics and single ANOVAs for each factor level indicated results that were less clear. It seems obvious that attitude change predictions were supported, even though the influence of regression to the mean and limitation of scales had an

effect on long term attitude change scores (4).

Of concern was the failure to support achievement predictions. Of note, however, was the trend of scores for the dissonance (below median) attitude level. The experimental group had better average achievement scores and a tighter spread of scores (SD) than did the control groups in the same level.

A post-hoc analysis of only control Ss was computed in order to uncover the possible reason for the failure to support achievement predictions. It was found that Ss who expressed positive attitudes toward the instructional activity on the first day of classes achieved significantly better than Ss who expressed more negative attitudes. This result supported similar findings reported from other studies (6, 18, 19, 21).

One of three alternative conclusions could be used to account for non-significant achievement results:

- that the achievement test (MAT) was measuring a concept only remotely related to the attitude test (MEAS),
- that attitude change does not have a significant impact on related achievement behavior, or
- that one or both tests (MAT, MEAS) were not measuring what they were designed to measure.

Further research is needed to conclude which

alternative is absolutely correct. However, it appears that the results of the post-hoc analysis would eliminate the first alternative from consideration because a positive relationship between MEAS and MAT was found for control Ss. The second alternative seems to be the more logical, at least in this experimental situation, even if this choice is not what it was hoped would be demonstrated by this study.

CONCLUSIONS

It was found that a student's attitude toward a specific college course could be measured and improved by applying cognitive dissonance theory assumptions in a formal plan of attitude change. This improved attitude toward the course tended to remain improved after two months. Achievement gains were found higher for experimental Ss who had their course related attitudes changed from a negative to a more positive position. However, this achievement gain was not a significant one. Thus, the impact of attitude change on achievement behavior was not completely explained in this study. Further experimentation is needed.

In this experiment videotape was used, not as a carrier of instructional information, but as a tool to record and preserve a student's attitude position toward a specific instructional situation. Even though the student did not actually observe recorded comments

the student was lead to believe that others would be observing these positive statements. This study demonstrated the power of television as an audio-visual tool able to record a student's comments toward an attitude position and preserve these comments not only on the videotape, but also in the cognitive structure of the student. Videotape can and should be used not only as a carrier of information, but also as an involvement tool for attitude change. Actually, it would seem that any media that can capture and preserve an attitude position would be effective in attitude modification. Television would seem to be the most powerful because of its ease of use, its audio-visual format and its popular acceptance as a communication method.

Attitude toward course content may be a crucial key to the acceptance of newer media in teaching. Locally produced materials using class students for actors and production crews may not only be effective for information dissemination but may also covertly work on student attitude structure. The impact of this possible change in attitude structure on achievement is not clear, yet would probably be an important goal for teaching and a rationale for using media in teaching.

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Table 1. Short Term Attitude Change

A. Descriptive Statistics

Pre-Treatment Attitude Levels(A)		Treatment Groups(T) Control	Irrelevant Videotape	Relevant Videotape
Above-Median (commitment)	$\bar{X}_1$	-1.12	-1.49	.78
	SD	3.93	3.50	3.80
	N	42	39	32
Below-Median (Dissonance)	$\bar{X}$	.07	1.10	5.47
	SD	5.02	5.68	4.94
	N	41	30	34

1=Average attitude change ($MEAS_{2-1}$)

B. Analysis of Variance

Source	df	SS	MS	F	p<
Treatment (T)	2	6.14	3.07	15.67	.0001*
Attitude Level (A)	1	4.34	4.34	22.11	.0001*
T x A	2	.72	.35	1.85	.16
Error	212	41.56	.20		

C. Analysis of Variance: Above-Median (commitment) Attitude Level

Source	df	SS	MS	F	p<
Treatment (T)	2	1.02	.51	3.62	.03*
Error	110	15.46	.41		
Scheffé Tests		F'**	F		
Control x Irrelevant Videotape		6.18	.20		
Control x Relevant Videotape		6.18	4.37		
Irrelevant Videotape x Relevant Videotape		6.18	6.83*		

D. Analysis of Variance: Below-Median (dissonance) Attitude Level

Source	df	SS	MS	F	p<
Treatment (T)	2	5.85	2.02	11.42	.0001*
Error	212	26.10	.26		
Scheffé Tests		F'**	F		
Control x Irrelevant Videotape		6.18	.65		
Control x Relevant Videotape		6.18	23.62*		
Irrelevant Videotape x Relevant Videotape		6.18	11.77*		

*p < .05

**F' = $(k-1)F_t$ (k=groups, F_t = p< .05 table value for F, with df 2, 100)

Table 2. Long Term Attitude Change

A. Descriptive Statistics

Pre-Treatment Attitude Levels (A)		Treatment Groups (T) Control	Irrelevant Videotape	Relevant Videotape
Above-Median (commitment)	$\bar{X}_1$	-2.26	-5.20	-2.34
	SD	4.94	8.03	4.30
	N	42	39	32
Below-Median (dissonance)	$\bar{X}$	0.90	0.77	3.68
	SD	6.43	6.50	6.79
	N	41	30	34

1=Average attitude change ($MEAS_{3-1}$)

B. Analysis of Variance

Source	df	SS	MS	F	p<
Treatment (T)	2	3.86	1.93	4.86	.009*
Attitude Level (A)	1	13.95	13.95	32.12	.0001*
T x A	2	.15	.07	.19	.83
Error	212	84.20	.40		

C. Analysis of Variance: Below-Median (dissonance) Attitude Level

Source	df	SS	MS	F	p<
Treatment (T)	2	1.85	.92	2.14	.12
Error	102	43.96	.43		

D. Analysis of Variance: Above-Median (commitment) Attitude Level

Source	df	SS	MS	F	p<
Treatment (T)	2	2.16	1.00	2.95	.05*
Error	110	40.24	.37		
Scheffé Tests		F'**	F		
Control x Irrelevant Videotape		6.18	.20		
Control x Relevant Videotape		6.18	4.37		
Irrelevant Videotape x Relevant Videotape		6.18	6.38*		

*p< .05

**$F' = (k-1)F_t$ (k=groups, F_t = .05 table value of F for df 2, 100)

Table 3. Achievement Change

A. Descriptive Statistics

Pre-Treatment Attitude Levels (A)		Treatment Groups (T) Control	Irrelevant Videotape	Relevant Videotape
Above-Median (commitment)	$\bar{X}_1$	23.50	23.80	21.56
	SD	5.82	6.28	6.80
	N	42	39	32
Below-Median (dissonance)	$\bar{X}$	21.22	20.83	23.00
	SD	7.53	7.54	6.53
	N	41	30	34

1=Average achievement change (MAT_{2-1})

B. Analysis of Variance

Source	df	SS	MS	F	p<
Treatment (T)	2	1.47	0.73	.02	.98
Attitude Level (A)	1	101.76	101.76	2.22	0.13
T x A	2	188.92	94.46	2.06	0.13
Error	212	9701.92	45.76		